

CHAPTER 1

GENERAL

1-1. Purpose and scope. The manual provides information, instructions, procedures, and criteria for the design of gravity systems for sanitary and industrial wastewater collection at Army installations.

1-2. Design objectives and limitations. The design of a wastewater collection system must provide an engineered system of sewers, complete with all appurtenant facilities, sufficient in size, slope, and capacity to collect and convey the required wastewater flows to an acceptable point of discharge. Sewers and appurtenances must be structurally sound. Elimination of excessive infiltration and inflow is essential in avoiding increased costs of sewer maintenance, wastewater pumping and treatment. Contributing waste flows which are harmful to sewer pipe materials and appurtenant structures, or create fire and explosion hazards, are to be handled separately. Wastewaters from fuel loading and dispensing systems, grease and oil from vehicle wash racks, aircraft washing and garage or shop floor drains, must be directed through POL product separators to prevent such wastes from entering the sewers. Combined sewers will not be permitted.

1-3. Alternatives to gravity sewers.

a. Wastewater pumping. There may be areas in which the topography is not well suited for construction of a gravity sewer system. In such areas, the installation of a gravity system would require deep and expensive trench excavation, jacking, boring, tunneling, or construction of long sewer lines to avoid unfavorable terrain. In cases like these, the existing topography and subsurface conditions at the site will determine if a pump or ejector station would be more feasible. Generally, a gravity sewer system will be justified until its cost exceeds the cost of a pumped system by 10 percent.

b. Grinder pumps and vacuum systems. Some areas under consideration may be further limited by high ground water, unstable soil, shallow rock, or extremely adverse topography, and neither gravity sewers nor pump or ejector stations will be suitable. To overcome these difficulties, grinder pumps with small diameter (less than 4-inch) pressure sewers may be utilized. In a typical installation, wastewater from individual buildings will be discharged to a holding tank, and then periodically transferred by grinder pump through small diameter pipe, into either a central pressure main, conventional gravity sewer, pumping station, or wastewater treatment facility. Vacuum systems offer an alternative to pressure sewers and may be used under similar circumstances.